IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Applicant:	Arun Kumar Jaura et al.
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Examiner:	Vaughn Coolman
Title:	COOLING SYSTEM AND METHOD FOR A HYBRID ELECTRIC VEHICLE
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AMENDED APPEAL BRIEF

This brief is submitted in response to the Notification of Non-Compliant Appeal Brief mailed April 3, 2009.

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I. Real Party in Interest

The real party in interest in this matter is Ford Global Technologies LLC, which is a wholly owned subsidiary of Ford Motor Company, both of Dearborn, Michigan (hereinafter "Ford").

II. Related Appeals and Interferences

There are no other known appeals or interferences which will directly affect or be directly affected by or have bearing on the Board's decision in the pending appeal.

III. Status of Claims

Claims 1 and 3-11 stand rejected. Claims 2 and 12-16 have been canceled. The rejection of each of Claims 1 and 3-11 is hereby being appealed.

IV. Status of Amendments

No Amendments were filed after the final rejection.

V. Summary of Claimed Subject Matter

Referring now to Figures 2, 3 and 4, as well as Paragraph 30 at Lines 1-8, Paragraph 31 at Lines 7-8, and finally at Paragraph 32 at Lines 1-13, Appellants claim a cooling system for a vehicle powertrain having a motor (63) and a transmission (64). Motor (63) has a stator housing (108). A cooling loop is in heat conductive contact with motor stator housing (108) and with transmission (64). The cooling loop (68) includes heat exchanger (78) and conduits (80, 82, 84) which provide a fluid flow connection between motor stator housing (108) and transmission (64). Heat exchanger (78) is also connected with motor stator housing (108) and transmission (64). The cooling loop also includes mechanical transmission pump (87) and an auxiliary pump (86). These pumps push the cooling fluid serially through the heat exchanger, then through the transmission, and then through the motor stator housing. Motor stator housing (108) is found

within integrated starter generator (63), which is depicted in Figure 2. The cooling system of Claim 1 further includes a controller (91) for receiving and processing input from at least one vehicle sensor (93) and for commanding auxiliary pump (86) to operate when the processed input of at least one vehicle sensor exceeds a pre-selected threshold. As set forth in Appellants' Specification at Paragraph 12, Appellants' system is intended to keep the motor at a temperature not exceeding 350° F, while keeping transmission (64) at a temperature not exceeding 250° F.

VI. Grounds of Rejection to be Reviewed on Appeal

Are Claims 1, 3, 4, 6 and 9 properly rejected under 35 U.S.C. §103(a) as being unpatentable over Barrie (U.S. Patent 5,217,085)?

Is Claim 5 properly rejected under 35 U.S.C. §103(a) as being unpatentable over Barrie in view of Prabhu (U.S. Patent 6,670,788)?

Is Claim 7 properly rejected under 35 U.S.C. §103(a) as being unpatentable over Barrie in view of Barnhardt (U.S. Patent 4,284,913)?

Is Claim 8 properly rejected under 35 U.S.C. §103(a) as being unpatentable over Barrie in view of Harper (U.S. Patent 6,066,060)?

Are Claims 10 and 11 properly rejected under 35 U.S.C. §103(a) as being unpatentable over Barrie in view of Tanaka (U.S. Patent 5,443,130)?

VII. Argument

Claims 1, 3, 4, 6 and 9 are not properly rejected under 35 U.S.C. §103(a) as being unpatentable over Barrie.

The Examiner's reliance upon Barrie is based upon an incorrect reading of Barrie. The Examiner states that Barrie discloses a "cooling loop in heat conductive contact with the motor stator housing and with the transmission." This is incorrect. At Column 1, Lines 50-56, Barrie states:

> The hydraulic system of the present invention includes a lubrication circuit and a cooling circuit in parallel with the lubrication circuit. The parallel arrangement provides uncooled fluid having relatively low viscosity to the lubrication circuit, thereby minimizing losses due to high viscosity oil circulating through a gearbox or other mechanical equipment.

Not to belabor the point, it seems abundantly clear from the citation above, as well as from observation of Barrie's Figure 1, that there is no cooling loop which is in heat conductive contact with motor stator housing (30) and with traction motor (28). It is noted that none of the fluid which flows through Barrie's heat exchanger (40) will ever flow through the reduction gear or transmission (30) without having been heated first by traction motor (28) before flowing to Barrie's coolant reservoir. This follows because there is no connection between heat exchanger (40) and reduction gear lube flow (30), as shown in Barrie's Figure 1. It seems that Barrie simply lacks any teaching or suggestion of a system in which fluid flows serially from a heat exchanger and then through a transmission, in this case Appellants' (64), before flowing through an electrical machine shown as integrated starter generator (63). As noted above, there is simply no connection between Barrie's heat exchanger (40) and his transmission (30). As a result, Barrie cannot comprise a colorable basis for the rejection of Appellants' Claim 1.

Regarding Claim 3, the Examiner states that it would be obvious to claim a systems controller. However, the Examiner cites nothing to overcome the basic deficiency noted in connection with Claim 1 and, as a result, Claim 3 is also allowable.

Regarding Claim 4, the Examiner argues that it would be obvious to provide increased coolant flow to a motor by running a pump in an opposite direction of Barrie. The fact of the matter remains, though, that these arguments regarding Claim 4 cannot overcome the basic deficiency noted above in applying Barrie to Claim 1, and Claim 4 is therefore allowable, as are Claims 6 and 9.

Regarding Claim 5, the Examiner cites Prabhu for the presence of an ISG, or integrated starter generator. However, Appellants respectfully submit that neither Barrie nor Prabhu, whether taken singly or in combination with each other, either teach or suggest Appellants' claimed invention that is set forth in Claim 1, from which Claim 5 depends and, as a result, Claim 5, too, is therefore allowable.

Regarding Claim 7, the Examiner cites Barnhardt for an auxiliary pump, but this rejection too must fail for the same reason as that cited in connection with Claim 5.

Regarding Claim 8, the Examiner cites Harper for an external pump, but Claim 8 is allowable for the reasons cited above.

Finally, regarding Claims 10 and 11, the Examiner cites Tanaka for a transmission and motor configuration having a stator housing overlapped by a transmission housing. However, Claims 10 and 11 are allowable for the reasons stated above.

In sum, each of the claims remaining in this case is allowable over the Examiner's rejection.

VIII. Conclusion

For the foregoing reasons, Appellant respectfully requests that the Board direct the Examiner in charge of this case to withdraw the rejection.

The Patent Office is authorized to charge any fee deficiency or refund any excess to Deposit Account No. 06-1510.

Respectfully submitted,

Date: 4/17/09

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Claims Appendix

1. **(Previously Presented)** A cooling system for a vehicle powertrain having a motor and a transmission comprising:

said motor having a stator housing;

a cooling loop in heat conductive contact with said motor stator housing and with said transmission;

said cooling loop comprising a heat exchanger and conduits providing a fluid flow connection between said motor stator housing said transmission, and said heat exchanger;

said cooling loop further comprising a mechanical transmission pump and an auxiliary pump; and

said cooling system further comprising a controller for receiving and processing input from at least one vehicle sensor, and for commanding said auxiliary pump to operate when the processed input of at least one vehicle sensor exceeds a pre-selected threshold.

2. **(Canceled)**

3. **(Previously Presented)** The cooling system of claim 1, wherein the controller is a vehicle system controller.

4. **(Previously Presented)** The cooling system of claim 1, wherein:

said cooling loop further comprises bypass conduits and bypass valves having actuators independently controllable by the controller to operate when the processed input from at least one vehicle sensor exceeds a pre-selected threshold; and

said auxiliary pump is reversible.

5. **(Original)** The cooling system of claim 1, wherein the motor is an integrated-starter-generator.

6. **(Original)** The cooling system of claim 1, wherein the powertrain is arranged in a series configuration.

7. **(Original)** The cooling system of claim 1 wherein the auxiliary pump is internal to the transmission.

8. **(Original)** The cooling system of claim 1 wherein the auxiliary pump is external to the transmission.

9. **(Original)** The cooling system of claim 1, wherein the cooling loop is configured to maintain a transmission temperature at no greater than 250 degrees Fahrenheit and a temperature for said motor at no greater than 350 degrees Fahrenheit.

10. **(Original)** The cooling system of claim 1, wherein the stator housing is overlapped by a transmission housing.

11. **(Original)** The cooling system of claim 1, wherein the stator housing is adjacent to a transmission housing.

12. -16. **(Canceled)**

Evidence Appendix

None.

Related Proceedings Appendix

None.